

## CLAIMS

Claims 1 - 16. (canceled)

17. (previously presented) An apparatus for detecting the presence and concentration of a target substance in a solution through differences in photo-induced charge movements between a control solution and a target solution containing the target substance, wherein a dye is utilized which produces photo-induced charge movements upon illumination and which produces a different amount of photo-induced charge movements upon illumination when in contact with said target substance, the apparatus comprising:

- a light source for illumination;

- a container to receive a target solution containing a target substance;

- a membrane disposed within said container;

- a dye adsorbed onto said membrane which produces photo-induced charge movements upon illumination and which produces a different amount of photo-induced charge movements upon illumination when in contact with said target substance, said dye being in contact with said target solution;

- an electrometer in electrical communication with said membrane to detect said photo-induced charge movements relative to said membrane and to generate a signal for analysis;

- means to analyze said signal to determine the presence and concentration of said target substance.

18. (original) The apparatus of claim 17, wherein said light source is chosen from the group of light sources consisting of lasers, stroboscopes and LEDs.

19. (original) The apparatus of claim 17, wherein said membrane is self-assembled monolayer.

20. (original) The apparatus of claim 17, where said analyzer means is an oscilloscope.